

2011-02-09 Beam Permit Meeting

Wednesday, February 09, 2011
3:48 PM

- **Mu2e Beam Permits**
 - **AP1/AP3/Accumulator Permit:**
 - Will use existing Pbar beam permit infrastructure.
 - Beam permit loop goes MCR->AP10->AP30->F27->AP0 S->F23->AP0 N->AP50->AP10->MCR
 - If we lose permit conditions, permit drops immediately and we send beam to Accumulator abort.
 - This permit will provide the single input back to the BSSB. This means a single beam switch and single beam permit, with no BSSB hardware replacement costs.
 - The Camac 201 module will need to be moved from the MCR to the location of the Accumulator abort kicker (AP50).
 - Camac 479 card will also be located at AP50 to monitor clock events and fall of the abort permit.
 - **Debuncher Permit:**
 - A second loop will be made for the Debuncher.
 - New cabling will need to be pulled between service buildings...AP50->AP30->AP10->AP50.
 - While new cabling is being pulled a spare set should also be pulled as it won't add much to the cost.
 - We will also need to pull cable out to the new Mu2e experimental building.
 - Cable runs will need to be copper due to expected radiation levels and the fact that some of the cable runs go through the tunnel enclosures.
 - The Debuncher beam permit will provide a single input to the AP1/AP3/Accumulator beam permit.
 - When the Debuncher beam permit goes away, we immediately abort the Debuncher beam, and pull the AP1/AP3/Accumulator permit.
 - Camac 201 and 479 cards will need to be located near the abort kicker at AP50.
 - **P1/P2 Permit:**
 - These two permits will combined if we don't have need to send beam to the Tevatron.
 - If this permit goes away, the Accumulator beam permit is dropped.
- **Operating scenarios:** Operating scenarios must be determined for controls to determine the pulse shift scenarios that will be used.
 - White board drawing showing entire beam path (http://www-drendel.fnal.gov/Mu2e/Storage_Rings/Instrumentation/Supporting-Documents/Whiteboard-Drawing-of-Mu2e-Layout.png).
 - **Mu2e Operational Mode beam path:** Booster -> MI-8 -> Recycler at MI-10 -> partial turn around RR -> Recycler to P1 transfer line at MI-52 -> P1 Line -> P2 Line -> AP1 Line -> AP3 Line -> Accumulator -> A/D Line -> Debuncher -> Extraction Line -> Mu2e.
 - **Accumulator studies mode beam path:** Booster -> MI-8 -> Recycler at MI-10 -> partial turn around RR -> Recycler to P1 transfer line at MI-52 -> P1 Line -> P2 Line -> AP1 Line -> AP3 Line -> Accumulator -> AP50 Accumulator dump.
 - Debuncher and Mu2e experiment beam permits are masked.
 - **Debuncher studies mode beam path:** Booster -> MI-8 -> Recycler at MI-10 -> partial turn around RR -> Recycler to P1 transfer line at MI-52 -> P1 Line -> P2 Line -> AP1 Line -> AP3 Line -> Accumulator -> A/D Line -> Debuncher -> AP50 Debuncher dump.
 - Mu2e experiment beam permit is masked.
 - **Mu2e Experiment Studies mode:** Booster -> MI-8 -> Recycler at MI-10 -> partial turn

around RR -> Recycler to P1 transfer line at MI-52 -> P1 Line -> P2 Line -> AP1 Line -> AP3 Line -> Accumulator -> A/D Line -> Debuncher -> Extraction Line -> Mu2e dump.

- NOTE: Asking around I found that there is not a beam line requirements document for the extraction line dump, so it is not clear if the design of this dump will be made to take the entire 25KW of possible beam power.

- **Additional hardware**

- We will have many more active inputs to the beam permits than we do presently with Pbar.
- An ample stock of spare Camac 200 modules will exist from the Tevatron which can be used for Mu2e. These Camac 200 modules would each need an EPROM or PAL change.

- **ACNET Interface**

- An ACNET interface will be needed for the beam aborts, similar to the current pbar interface page P67.
- Controls can implement a page (or pages if we want separate pages for the Debuncher and Accumulator permits) based on our needs using an already written generic template. Coding time would be a week or two at most.